NAVFAC
Naval Facilities Engineering Command
ACTIVITY NAME

# IR-03 Pilot Study Update

## Cabrera-Insight JV / CDM Smith

BCT Meeting

Hunters Point Naval Shipyard

*March 27, 2014*

# Location: HPNS IR03

# HPNS IR03 – Overview

- **Nonaqueous phase liquid (NAPL) Treatment Pilot Study (NTPS):**

| Activity | Schedule |
|---|---|
| In Situ Thermal Remediation (ISTR) Operation | February 4 – May 30, 2014 |
| ISTR Performance Soil and Groundwater Sampling | June 2014 |
| In Situ Solidification/Stabilization (ISS) Design – Draft to BCT | April 16, 2014 |

# ISTR System


# Observations Reported at the Last BCT Meeting

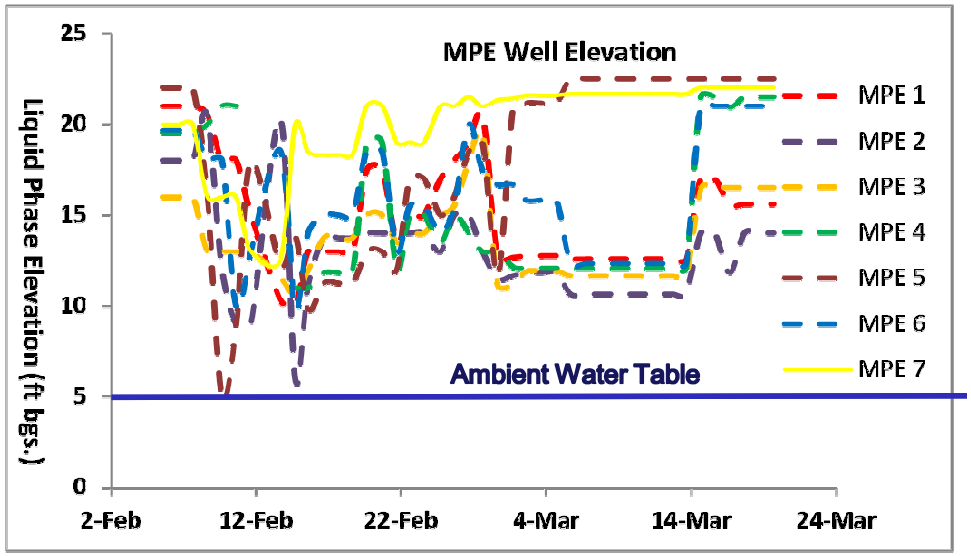
- Approximately 370 gallons of NAPL were collected through February 4, 2014
- Temperatures at most wells reached 90°C within three weeks
  - –Using a heat exchanger to increase the temperature of injected water has proved to be very efficient
- Pneumatic control of the system was maintained
- Hydraulic gradients towards the treatment system zone were established

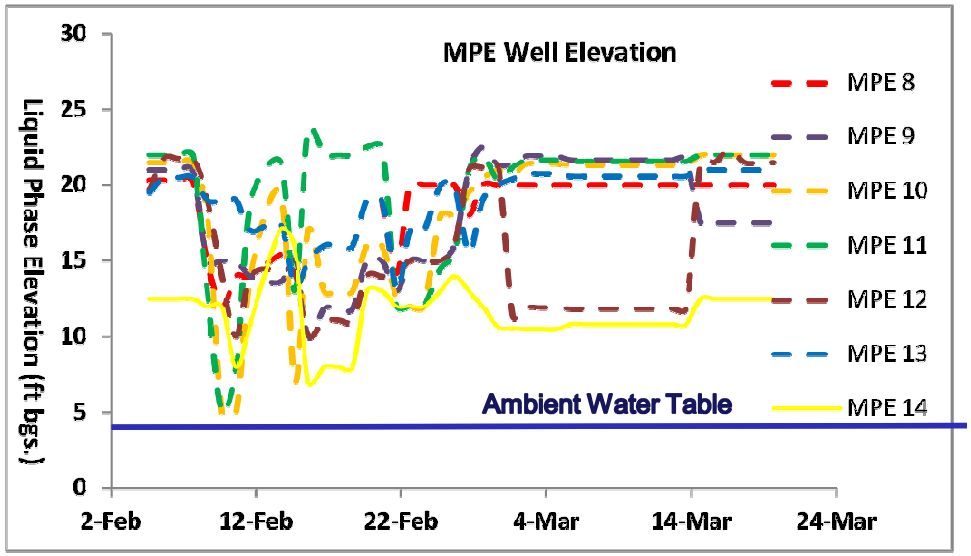
# ISTR System Operation: New NAPL Separation Tank


- Old- 1000 gallon NAPL Separator
- Large volumes of NAPL required longer retention for phase separation.

- New- 10,000 gallon NAPL Separator

# Hydraulic Control: February/March




- Each extraction well pumping at an average rate of 0.4 gpm.
- Pumping at a total rate of approximately 5,000 – 12,000 gal/day (~200 – 500 gal/hr).
- Total pumped volume up to approximately 345,000 gallons through 03/19/14.
- Pressures within the system are low; pneumatic control is maintained.

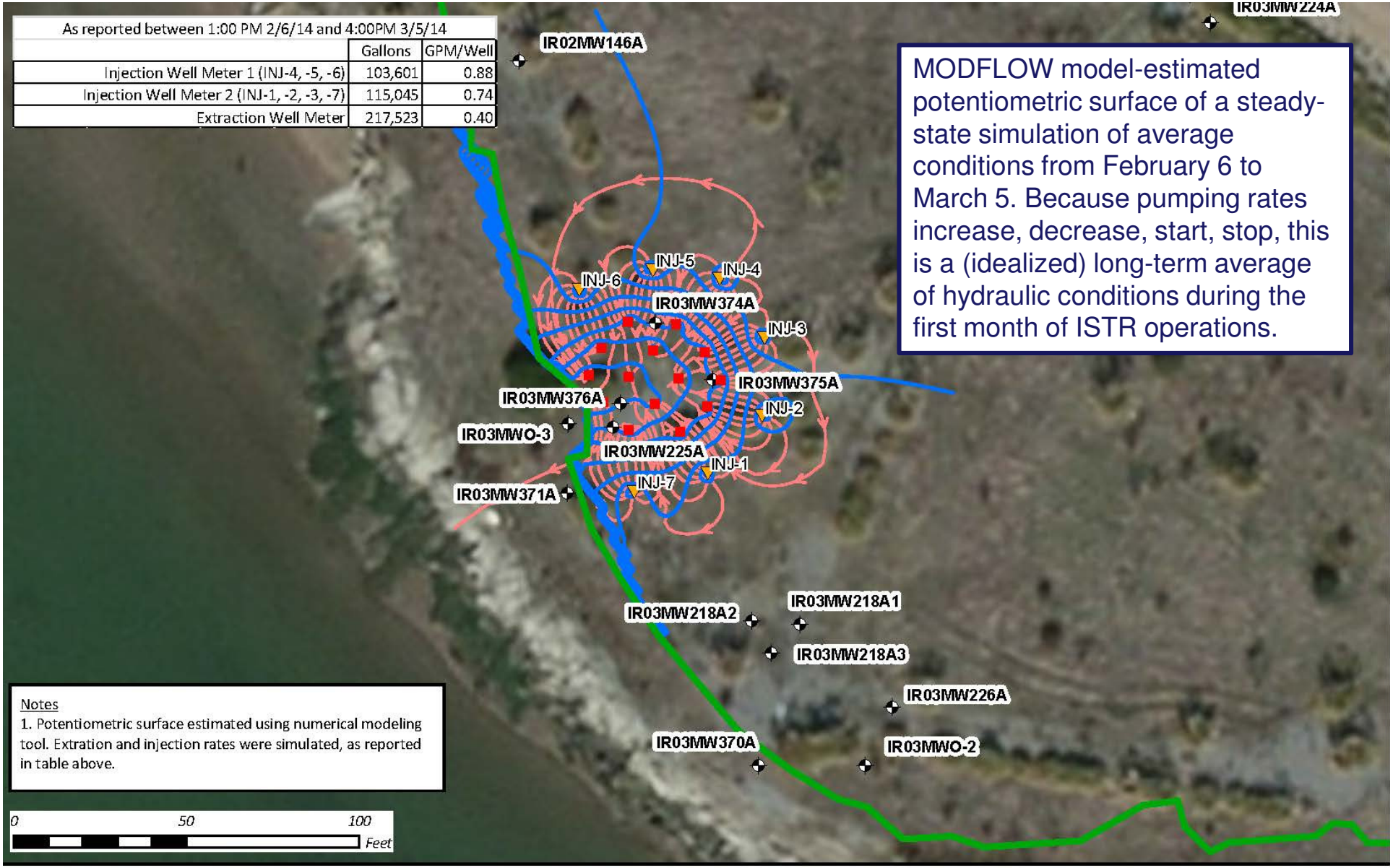
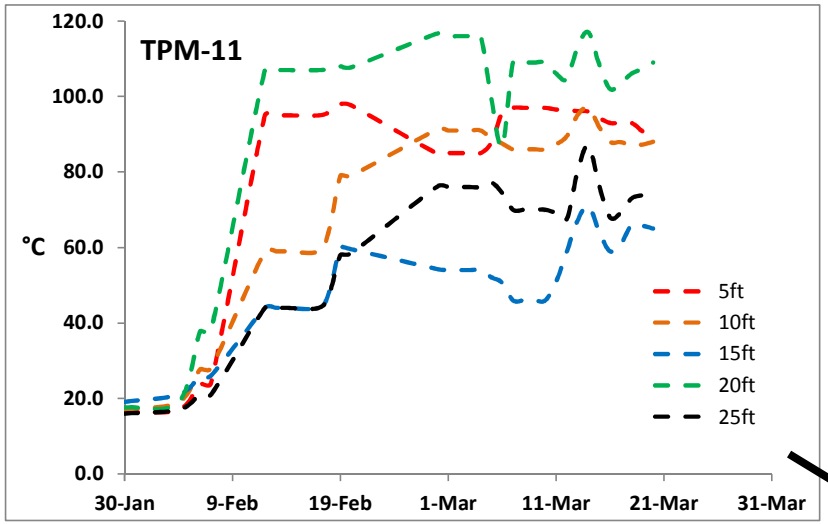
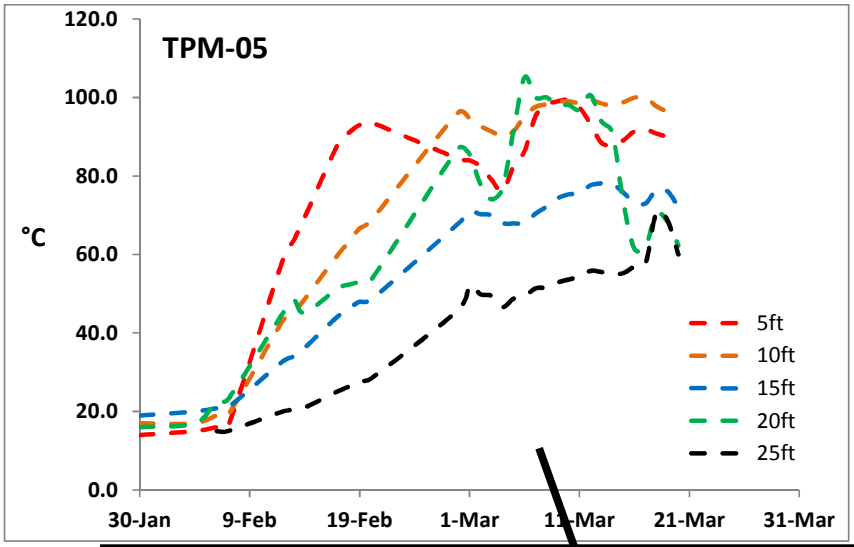


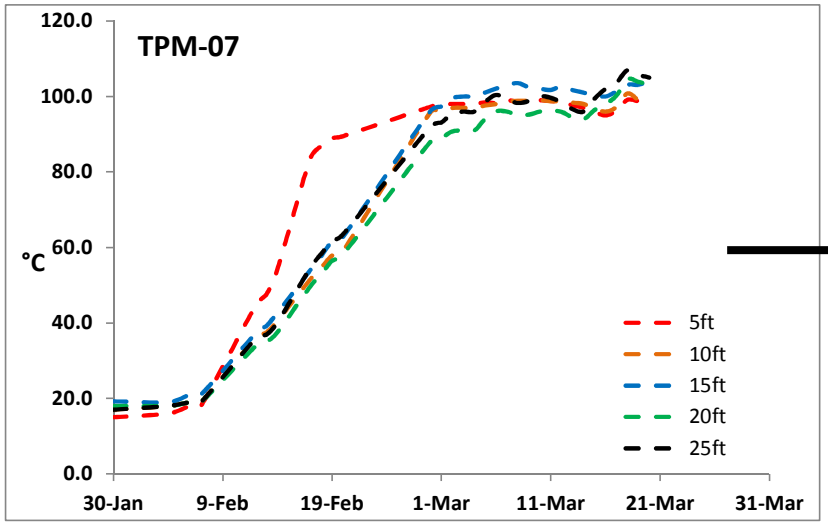

**Figure 1**

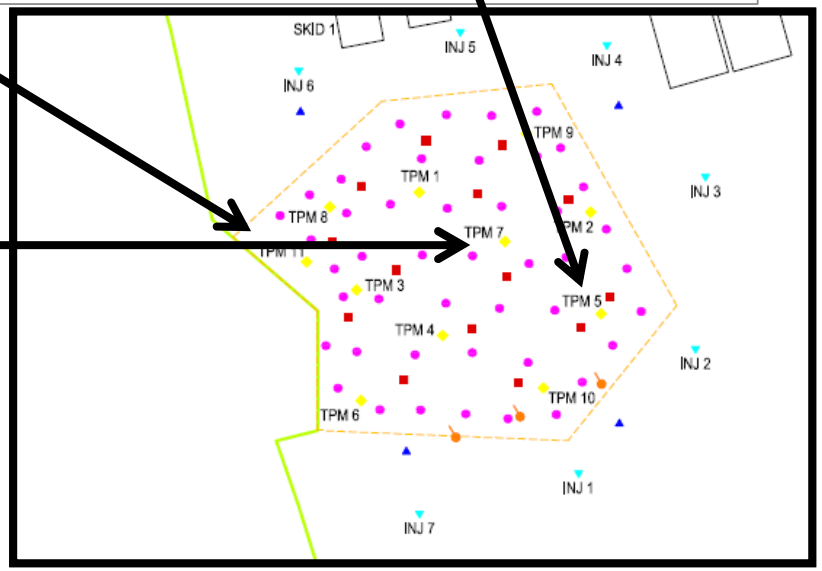
Model-Estimated Capture Zone, First Month of ISTR Operation

# Temperatures in Treatment System

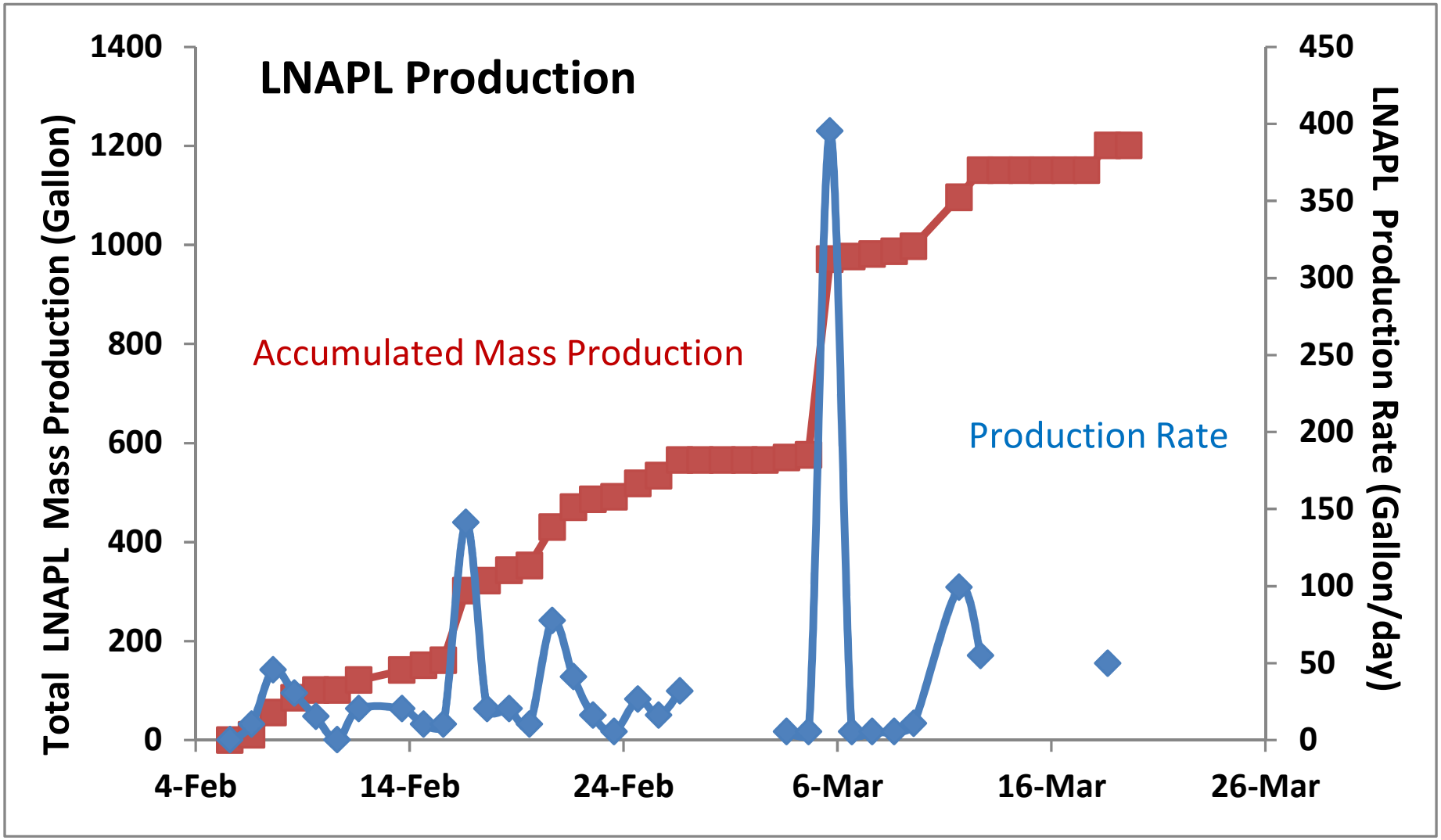


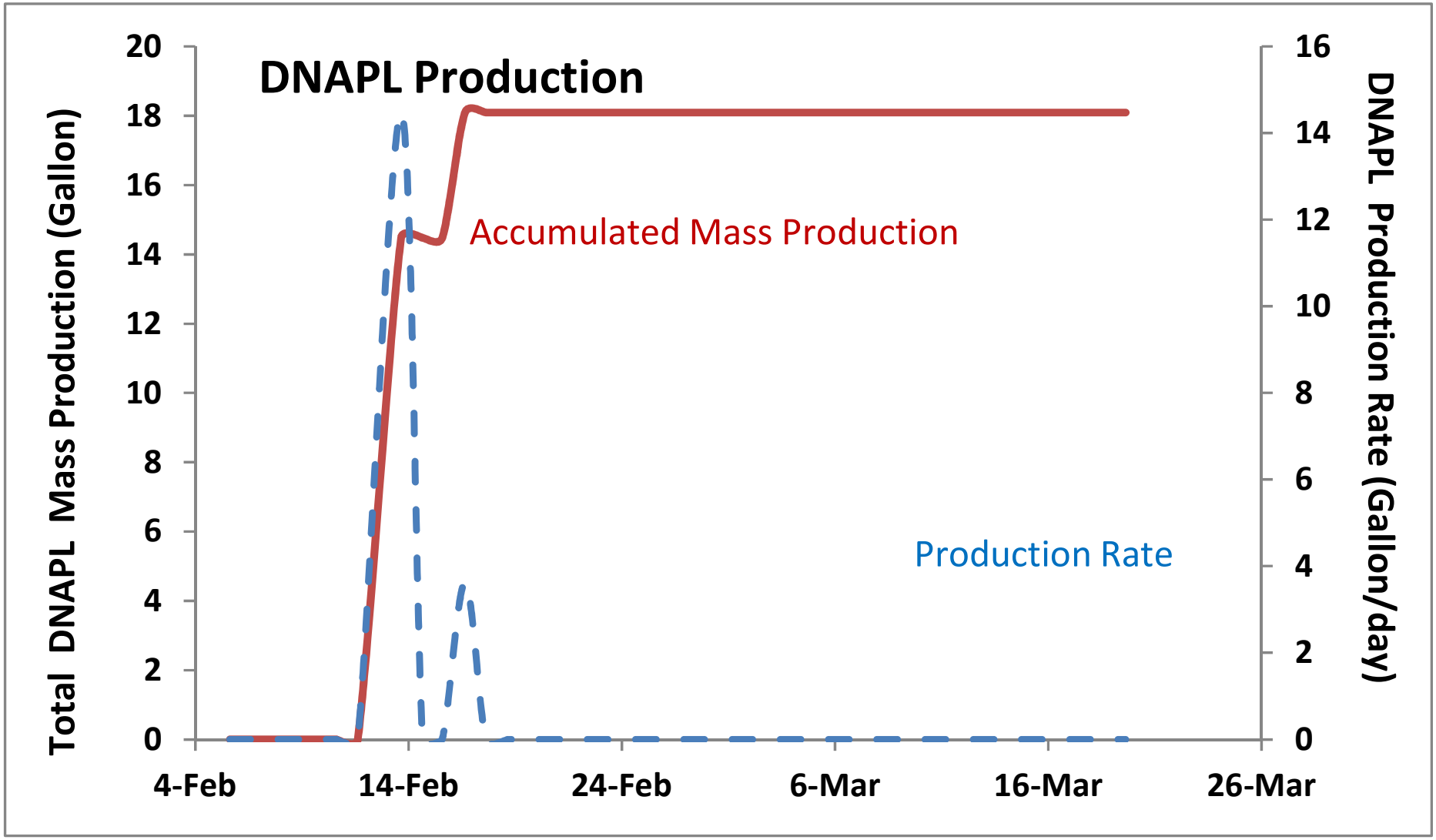



# LNAPL Production



# DNAPL Production



# Summary

- As of 3/19/2014:
  - –345,000 gallons of water have been recirculated.
  - –1200 gallons of NAPL have been extracted.
- Significant amounts of NAPL are still being extracted.
  - –We’re in the process of incorporating VGAC and LGAC data into the LNAPL production
  - –TO-15 data is in the process of validation
- Operations will continue with temperatures slowly ramping up to boiling.
- Criteria for shutting down ISTR system:
  - –Cessation of NAPL recovery
  - –Minimum number of pore volumes (at least 3) recirculated with no NAPL recovery.